

Chapter 4 BLM Answers

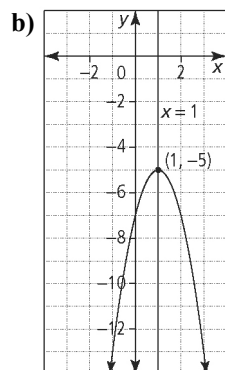
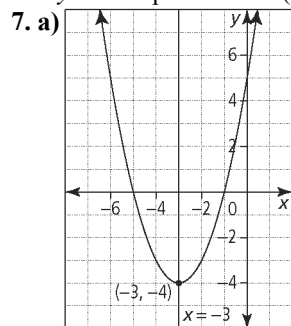
BLM 4-2 Chapter 4 Prerequisite Skills

1. **a)** $2x - 17$ **b)** $15x^2 - 10x$
c) $8x^2 + 14x - 15$ **d)** $25x^2 - 40x + 16$
2. **a)** $xy(3 - 8x)$ **b)** $3p(1 - 3p)$ **c)** $(x - 1)(x - 12)$
d) $(2a - 3y)(2a + 3y)$ **e)** $4(2r + 1)(r + 2)$
f) $2(x - 0.2y)(x + 0.2y)$
3. **a)** $x = \frac{-2}{5}$ Check:

$$7\left(\frac{-2}{5}\right) - 3 = 2\left(\frac{-2}{5}\right) - 5$$

$$\left(\frac{-29}{5}\right) = \left(\frac{-29}{5}\right)$$

- b)** $x = 6$ **c)** $x = -2$
4. **a)** $(2, -9)$ **b)** $x = 2$ or $x - 2 = 0$
c) $\{y \mid y \geq -9\}$
d) $(0, -5)$ or y -intercept -5
e) $(-1, 0)$ and $(5, 0)$
5. **a)** 11 **b)** $-\frac{3}{2}$
6. **a)** Equation for the axis of symmetry is $x = p$, so in this case it is $x = 3$.
b) Vertex at (p, q) , so it is at $(3, 5)$.
c) Since a is negative, the parabola opens downward, and the function has a maximum value.
d) Parabola opens down from $(3, 5)$, so there are two x -intercepts.
e) $x = 0$ at the y -intercept. Substitute to get $y = -13$. The y -intercept occurs at $(0, -13)$.



8. **a)** $y = -3x^2 + 6x - 1$; $a = -3, b = 6, c = -1$
b) $y = \frac{3}{2}x^2 + 12x + 19$; $a = 1.5, b = 12, c = 19$
9. **a)** $y = (x - 5)^2 + 6$; $a = 1, p = 5, q = 6$
b) $y = 6(x + 2)^2 - 7$; $a = 6, p = -2, q = -7$
c) $y = -4\left(x - \frac{5}{2}\right)^2 + 22$; $a = -4, p = \frac{5}{2}, q = 22$
10. 12

BLM 4-3 Chapter 4 Warm-Up

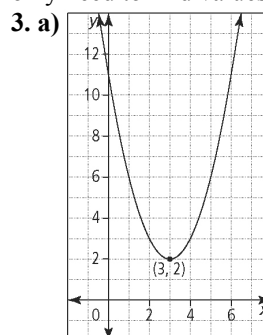
Section 4.1

1. **a)** 39 **b)** 9 **c)** 12

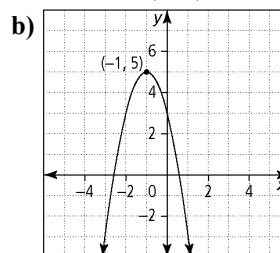
2. **a)**

x	-2	-1	0	1	2	3	4
$f(x)$	-25	-10	-1	2	-1	-10	-25

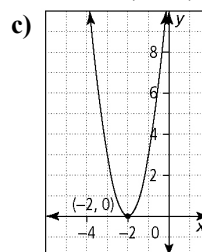
- b)** $x = 1$ **c)** 2 **d)** Function values are the same on opposite sides of the axis of symmetry, so you really only need to find values for half the table.



vertex: $(3, 2)$; no x -intercepts



vertex: $(-1, 5)$; two x -intercepts

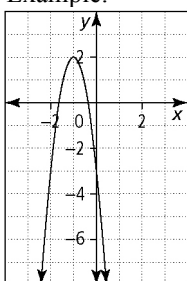


vertex: $(-2, 0)$; one x -intercept

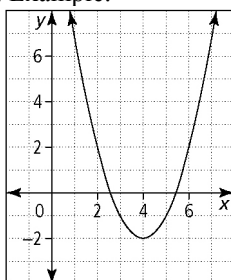


4. a) $x = 1$ b) $(1, -4)$ c) $(-1, 0)$ and $(3, 0)$
d) a is positive or $a > 0$.

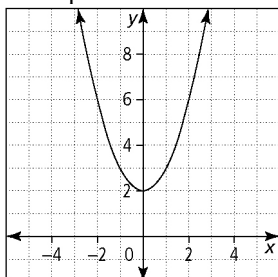
5. a) Example:



b) Example:



c) Example:



Section 4.2

1. a) $x^2 - x - 12$ b) $13x^2 - 28x$
c) $6x^2 - 11x - 7$ d) $4x^2 - 12x + 9$ e) $4x^2 - 49$
2. a) $2(x + 5) + 2(2x - 3) = (6x + 4)$ cm
b) $(x + 5)(2x - 3) = (2x^2 + 7x - 15)$ cm²
3. a) $x = -6$ b) $x = -3$
4. a) $(x + 7)(x - 3)$ b) $(x + 5)(x + 2)$
c) $(2x - 3)(x - 2)$ d) $(4x - 1)(x + 3)$
5. a) $-3(x^2 - 3xy + 2y^2) = -3(x - y)(x - 2y)$
b) $49 - 4x^2 = (7 - 2x)(7 + 2x)$
c) $2(x^2 - 6x + 9) = 2(x - 3)(x - 3)$, or $2(x - 3)^2$
d) $3x(x^2 - x + 9)$
e) $(x^2 - 4)(x^2 + 4) = (x - 2)(x + 2)(x^2 + 4)$

Section 4.3

1. a) approximate b) 5.292 c) 2
d) 4 and 5 e) $x = 0$, $x = 1$
2. a) $x = \pm 6$ b) $x = \pm 2$
c) $y = \pm 10$ d) $x = 12$ or $x = -6$
e) $p = 4$ or $p = -3$

3. a) $2x^2 - 7x + 5 = 0$
b) $3x^2 - 24x + 53 = 0$
c) $x^2 + x - 6 = 0$
d) $3x^2 + 4x - 4 = 0$
4. a) 16 b) 144 c) $\frac{9}{4}$ d) $\frac{1}{9}$

5. Method 1: Multiply and solve:

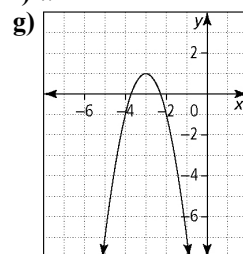
$$\begin{aligned} x^2 + 4x + 4 - x - 2 &= 42 \\ x^2 + 3x - 40 &= 0 \\ (x - 5)(x + 8) &= 0 \\ x = 5 \text{ or } x = -8 \end{aligned}$$

Method 2: Substitute for $x + 2$ and solve. Then substitute back:

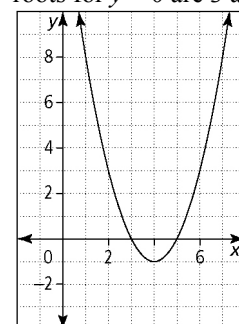
$$\begin{aligned} \text{Let } m &= x + 2. \\ m^2 - m - 42 &= 0 \\ (m + 6)(m - 7) &= 0 \\ m = -6 \text{ or } m &= 7 \\ \text{Then, } -6 = x + 2, \text{ so } x &= -8, \text{ or } 7 = x + 2, \text{ so } x = 5. \end{aligned}$$

Section 4.4

1. a) $g(x) = 3(x + 1)^2 - 2$
b) function f c) function g
d) $\{y \mid y \leq 1\}$ e) $f(x) = -2x^2 - 12x - 17$
f) $x = -1$

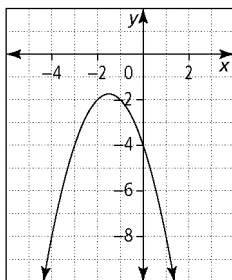


2. a) $x = 5.7$ or $x = 2.3$
b) $x = -0.8$ or $x = 2.1$
3. a) $\frac{3}{4}x^2 + 6x - 1 = 0$, $a = \frac{3}{4}$, $b = 6$, $c = -1$, or
 $3x^2 + 24x - 4 = 0$, $a = 3$, $b = 24$, $c = -4$
b) $-x^2 + 4x - 9 = 0$, $a = -1$, $b = 4$, $c = -9$
4. Example: a) complete the square: $x = -3 \pm \sqrt{13}$
b) factor: $x = \frac{3}{2}$ or $x = -2$
c) graph the quadratic function $f(x) = x^2 - 8x + 15$;
roots for $y = 0$ are 3 and 5

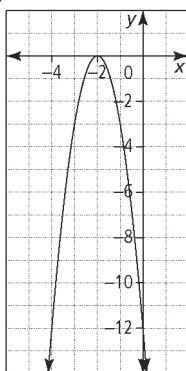


BLM 4–4 Section 4.1 Extra Practice

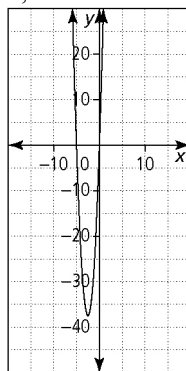
1. a) 2 b) none c) 2 d) 1
 2. a) -3, 2 b) no real roots c) -8.2, 1.2 d) 3
 3. a) no solution



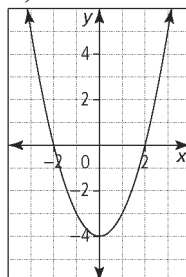
b) -2



c) 0, -5



d) 2, -2



4. a) 1.1, -3.5 b) -3.9, 3.9 c) no solution
 d) -2.8, 1.8
 5. Example:
 a) -10, 15
 b) -20, 20

- c) -0.7, 0.1
 d) no solution
 6. a) $m = 16$ b) $m < 16$ c) $m > 16$
 7. 4.5 s
 8. 5 cm, 12 cm, 13 cm

BLM 4–5 Section 4.2 Extra Practice

1. a) $(x+4)(x-5)$ b) $3(x-3)(x-7)$
 c) $-4(x+1)(x+2)$ d) $\frac{1}{2}(x+3)(x-4)$
 2. a) $(2x-1)(7x+5)$ b) $(x+5)(3x-4)$
 c) $(4x+3y)(x+y)$ d) $(2x-3)(3x-4)$
 3. a) $4(3x+2y)(x-y)$ b) $3y(2x+5)(x+2)$
 c) $10(7x-5y)(2x-5y)$ d) $7x(3x+y)(2x+3y)$
 4. a) $(x-7y)(x+7y)$ b) $(5x-3)(5x+3)$
 c) $\left(x+\frac{5}{2}y\right)\left(x-\frac{5}{2}y\right)$ or $\frac{1}{4}(2x+5y)(2x-5y)$
 d) $16(x-3)$
 5. a) $(x+4)(x-8)$ b) $(6x+7)(4x-3)$
 c) $2(7x+4)(7x-3)$ d) $(2x^2+3)(x^2-3)$
 6. a) -3, 5 b) 4, -8 c) 3, 6 d) $\pm\sqrt{5}$
 7. a) $-\frac{1}{2}, \frac{4}{3}$ b) 5, $-\frac{1}{7}$ c) $-\frac{1}{5}, 2$ d) $\frac{3}{2}, -6$
 8. a) $\frac{13}{8}, -\frac{13}{8}$ b) $\frac{7}{3}, -\frac{7}{3}$ c) $\frac{1}{4}, -\frac{1}{4}$ d) 8, -10
 9. a) -1, $\frac{2}{3}$ b) $\frac{1}{2}, 4$ c) $-\frac{1}{3}, \frac{1}{2}$ d) 6, $-\frac{7}{2}$
 10. a) $-\frac{1}{3}$ b) $\frac{3}{2}$ c) $-\frac{5}{2}$ d) $\frac{4}{7}$

BLM 4–6 Section 4.3 Extra Practice

1. a) 36 b) 100 c) $\frac{49}{4}$ d) $\frac{4}{25}$
 2. a) $(x+3)^2 = 5$ b) $(x-4)^2 = 11$ c) $\left(x-\frac{5}{2}\right)^2 = \frac{67}{12}$
 d) $(x+5)^2 = 33$
 3. a) -1, 9 b) 0, -1 c) 0.9, -0.7 d) -7.5, -6.5
 4. a) $-1 \pm \sqrt{3}$ b) $\frac{5 \pm \sqrt{13}}{2}$ c) 0.2, -0.8 d) $\frac{3}{7}$
 5. a) $\frac{3}{4}, -1$ b) $-1 \pm \frac{2}{\sqrt{3}}$ c) $-2 \pm 2\sqrt{6}$ d) 1, 5
 6. a) -0.21, 4.71 b) -0.26, 1.26 c) -9.47, -0.53
 d) -0.88, 0.38
 7. 6, 16

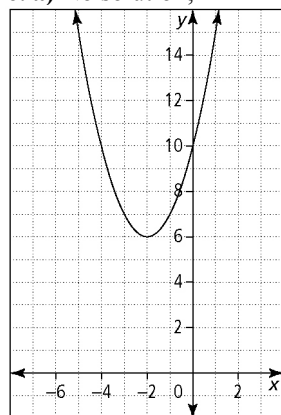
BLM 4–7 Section 4.4 Extra Practice

1. a) two real roots b) no real roots c) one real root
 d) no real roots
 2. a) none b) 1 c) 2 d) 2
 3. a) $5 \pm \sqrt{2}$ b) $\frac{7 \pm \sqrt{3}}{2}$ c) $\frac{2}{3}$ d) 0, $\frac{3}{2}$
 4. a) 0.50, 0.33 b) no solution c) -0.59, 2.26
 d) -4.46, 1.12



5. a) $-2 \pm \sqrt{5}$ b) $\frac{1 \pm 2\sqrt{2}}{2}$ c) $\frac{-5 \pm \sqrt{3}}{4}$ d) $2 \pm \sqrt{7}$

6. a) No solution;



b) 0, -7; Factor method: can be factored quickly because x is a common factor

c) $-\frac{5}{2}$; Factor method: a perfect square trinomial

d) $-4 \pm \sqrt{3}$; Complete the square method: already in the form $(x + a)^2 = b$

e) $\frac{-1 \pm \sqrt{7}}{6}$; Quadratic formula: exact values are required for the answer

7. a) -3 b) $-\frac{1}{2}$

BLM 4–8 Chapter 4 Review #22

$$ax^2 + bx = -c$$

$$x^2 + \frac{b}{a}x = -\frac{c}{a}$$

$$x^2 + \frac{b}{a}x + \frac{b^2}{4a^2} = \frac{b^2}{4a^2} - \frac{c}{a}$$

$$\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$$

$$x + \frac{b}{2a} = \pm \sqrt{\frac{b^2 - 4ac}{4a^2}}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Subtract c from both sides.

Divide both sides by a .

Complete the square.

Factor the perfect square trinomial.

Take the square root of both sides.

Solve for x .

BLM 4–9 Chapter 4 Test

1. A 2. B 3. D 4. B 5. A

6. $\frac{5\sqrt{5}}{2}$ or 5.59 s

7. a) In line 2, -4 should be in brackets. $\frac{2 \pm \sqrt{10}}{2}$.

b) In step 3, each term should have been divided by 15. $\frac{-3 \pm \sqrt{39}}{15}$.

8. a) $x = 2$ or 8; Example: Factoring, because the equation is easily factored to $(x - 2)(x - 8)$.

b) $x = -7$ or $x = \frac{2}{3}$; Example: Quadratic formula, because the equation is not readily factored.

c) $x = 3 \pm \sqrt{2}$; Example: Completing the square, because it is easy to find the perfect square.

d) $x = 1$ or 5; Example: Determining square roots, because it is easy to find the roots for $(x - 3)^2 = 4$

9. $x^2 + 5x - 10 = 0$; $\frac{-5 \pm \sqrt{65}}{2}$

10. $|k| > \frac{5}{2}$

11. 11.3 m by 9.3 m

12. $\frac{2}{3}$ or $\frac{3}{2}$

13. 2.57 s

BLM U2–4 Unit 2 Test

1. A 2. B 3. C 4. B 5. B

6. A 7. B 8. 2 9. $a = \frac{1}{3}$ 10. 5

11. a) $x = 3.5$; (3.5, -7); up; all real numbers; (0, 31.1)

b) $y = \frac{28}{9}(x - 3.5)^2 - 7$

12. (1, -3); all real numbers; $y \geq -3$; up; $x = 1$; x -intercepts have values of 1.87 and 0.13; y -intercept has a value of 1

13. a) 2 m b) 3.67 m c) 8.05 m

